REMARKS

Claims 1-6 are pending. This Amendment adds claim 7. Entry and consideration of this Amendment are respectfully requested.

Claims 1-2 and 5-6 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent 4,728,628 to Fiddyment *et al.* (herein "Fiddyment") in view of "High-Power High-Efficiency 0.98μm Wavelength InGaAs-(In)GaAs(P)-InGaP Broadened Waveguide Lasers Grown by Gas- Source Molecular Beam Epitaxy," IEEE Journal of Quantum Electronics, Vol. 33, No. 12, pages 2266-2276, by Gokhale *et al.* ("herein Gokhale") and "A study of structures with Al-free QWs in AlGaAs waveguides for laser diodes emitting at 800 nm," by Erbert *et al.* (herein "Erbert").

Applicants supplement the arguments presented in the Response of February 1, 2002, as follows.

Contrary to the Examiner's assertions that "Fiddyment discloses a semiconductor laser (abstract) that includes a quantum well laser," Fiddyment does not disclose a quantum well. As explained at column 5, lines 30-45 of Fiddyment, the active layer 4 and buffer layers 3 and 5 are each 0.2 μm. Such an active layer of 0.2 μm is too thick to experience band gap quantization, and thus, is not a quantum well. Fiddyment is disclosing an conventional semiconductor laser. There is no discussion of quantum well lasers in Fiddyment.

Moreover, Erbert does not suggest an aluminum free active region, as defined by claim 1. The claimed active region "includes at least one quantum well <u>and</u> upper and lower optical waveguide layers." In comparison, the aluminum free "active region" of Erbert is a 15-20 nm

InGaAsP or GaAsP single quantum well laser. *See* Fig. 1. The waveguide layers providing the strain on the SQW are graded index <u>Al</u>GaAs layers and the cladding layers are also <u>Al</u>GaAs. Accordingly, the upper and lower optical waveguide layers are not aluminum free, such that the active region of Erbert does not satisfy or suggest all of the claim requirements.

Further, Erbert discloses that using AlGaAs waveguides reduces leakage currents "probably due to the higher band-offsets in the conduction band between the QWs and the AlGaAs barriers in comparison to quaternary ones." *See* middle of fifth full paragraph. According to Erbert, the benefit of reduced leakage comes from the higher band-offsets at the quantum well—<u>Al</u>GaAs waveguide interface, in comparison to the band-offsets achieved between quantum wells and quaternary waveguides. This advantage of Erbert is dependent upon the use of waveguides containing aluminum, effectively suggesting away from the claimed upper and lower optical waveguide layers, which are aluminum-free waveguide layers. Erbert forms the cladding layers from the same material as the waveguide layers, but is otherwise silent as to any advantage to having aluminum cladding layer.

The benefits of AlGaAs optical waveguide layers taught in Erbert do not support the Examiner's statement that "it would have been obvious to someone of ordinary skill in the art of semiconductor lasers at the time of the invention to use AlGaAs as an upper and lower cladding layer to conform with conventional practice while making the QW free of Al to decrease the rate of laser degradation." Paper No. 11, paragraph bridging pages 3-4. The nomenclature of claim 1 includes the upper and lower waveguide layers within the aluminum free active region, whereas Erbert is clearly teaching advantages to using <u>Al</u>GaAs waveguide layers.

PRELIMINARY AMENDMENT
CPA of Application No. 09/315,068

For these reasons, together with the reasons presented in the Amendment of May 14, 2001, and the Response of February 1, 2002, Applicants submit that the claims are not obvious in view of the applied art. Applicants have not reproduced all of the arguments in the May 14, 2001 and February 1, 2002 filings only for the purpose of brevity, and ask the Examiner to reconsider the arguments offered therein when reconsidering the points cited above.

Respectfully submitted,

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APPENDIX

Version With Markings To Show Changes Made

IN THE CLAIMS:

Claim 7 is added as a new claim.